

Effect of seed priming on some physiological and agronomic characteristics of sunflower varieties

Abstract

In order to study the Effect of seed priming on some physiological and agronomic characteristics of sunflower varieties, has been conducted an experiment as split plot based on randomized complete block design with three replications. The main factor included two cultivars of sunflower, master and shahrood native mass and its sub factor was in seven levels including non-priming, salicylic acid priming in two levels of 50 and 100 ppm, ascorbic acid in two levels of 50 and 100 ppm and zinc sulfate in two levels of half and one per thousand. The results of analysis of variance showed that the effect of cultivars and its interactions with seed priming was significant on biomass yield, grain yield, oil yield, oil percentage, number of seeds per head, thousand seed weight, proline, catalase, superoxide dismutase, guaiacol peroxidase and ascorbate peroxidase. The results showed that the highest grain yield, oil yield, number of seeds per head and thousand seed weight were obtained from master cultivar under conditions of application of one per thousand zinc sulfate; and highest yield of biomass was obtained from master cultivar under conditions of application of 100 ppm ascorbic acid. Also, the highest percentage of seed oil from maser cultivar and in terms of application of half per thousand, the highest amount of proline from shahrood native mass cultivar and in non-priming conditions, the highest chlorophyll index in terms of application of 100 ppm ascorbic acid and the highest number of heads per plant in terms of application of 50 ppm ascorbic acid was obtained. In addition, the highest activity of grain catalase enzyme, the highest activity of the enzyme guaiac peroxidase from master cultivar and in terms of application of one per thousand zinc sulfate, the highest activity of the enzyme superoxide dismutase and finally the highest activity of the ascorbate peroxidase enzymes from shahrood native mass cultivar and in terms of application of one per thousand of zinc sulfate were obtained. In order to obtain maximum yield and quantitative and qualitative yield components, use of master and subsequently shahrood native mass cultivar in terms of application of 100 ppm ascorbic acid in order to obtain maximum seed oil content and activity of enzymes. Application of zinc sulfate is recommended for cultivating sunflower cultivars in the area.

Keywords: Antioxidant enzymes, Halo priming, Hormone priming, Oil yield, Sunflower



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